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SS WILLIAM LAWRENCE 38 BU 709

STATEMENT OF HISTORIC CONTEXT

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16 March, 1995

The shipwreck of the *SS William Lawrence* (1899) is of local, state, and national historic significance. The hull structure of the wreck and its well-preserved cargo contents yield information about nineteenth century maritime commerce, technology and transportation. Furthermore, the *Lawrence* is the only historic offshore shipwreck which is a popular recreational diving site that falls within South Carolina's legal jurisdiction for cultural resources (site no. 38BU709).

NATIONAL SIGNIFICANCE: TECHNOLOGY AND TRANSPORTATION

The Builders and Owners

The ship was built by the Atlantic Ironworks in Boston in 1869. She was ordered by the Merchants and Miners Transportation Line, whose passenger and cargo steamers had been running up and down the East Coast since 1852. In February 1869, the Transportation Company commissioned the Atlantic Iron Works to build the *SS William Lawrence*, which is described as one of the notable iron vessels built by the shipyard. Like the other ships belonging to the Company, this ship was named after one of the directors. The *SS William Lawrence* was the first to be equipped with a surface condenser and the company's first iron screw propeller steamer.¹ At the time the *SS William Lawrence* was wrecked in South Carolina waters in 1899, the steamer was the oldest vessel employed by the Company, and the first commissioned to be built by it. She had made 1,040 east coast voyages which is a record equaled by few other coastal steamers.²

The Atlantic Ironworks was one of the principal iron shipbuilding yards in the country during the latter half of the 1800's. Other ships built by the Atlantic Ironworks included some for Russian and Chinese waters: the *Kilauea*, for the Sandwich Islands; and the *Pembroke* for American owners. During the Civil War, the Company produced several of the Union Monitors. Other vessels built by

¹ Merchants and Miners Transportation Company, *Tales of the Coast and a Brief History of the Merchants and Miners Company, 1852-Seventy Fifth Anniversary-1927* (Merchants and Miners Transportation Company, Baltimore, 1927), pp. 1-5.

² Savannah Morning News, 14 February 1899.

Company included tugs, ferries and lighters for the port of Boston and components such as turrets for several iron clad ships and engines for American frigates.³

The Civil War had in many respects been disastrous to shipping and shipbuilding industries. In one aspect it was advantageous: the iron-clad warships produced during the War did much to stimulate the rolling of iron plates, the development of tools to work them and the education of workmen in their fabrication. Thus, much wider use of this material for shipbuilding became possible. The *SS William Lawrence* is an excellent national example of the small iron screw steamer of this post-war period.⁴

The Hull Design and Machinery

The *SS William Lawrence* was a iron steamship still retaining a small sailing rig as an auxiliary means of propulsion. The vessel was 207.8 feet in length with a 25.1 foot beam. The gross tonnage was 1,049 and the net register of 576 tons. The hold was 20 feet in depth and the hull shape is referred a *chicken beak bow* design.⁵

The use of iron in shipbuilding, although introduced in the 1920's and 30's, only became widespread in late nineteenth century at the time the *Lawrence* was built. Apart from fears that iron, because it is heavier than water, was an unsuitable material for shipbuilding, there were other reasons for the delay of its' adoption. The science of engineering had yet to perfect a method of bending iron to a desired shape. The only methods available at the beginning of the nineteenth century were casting in a mould or working when red hot by hammering. These methods frequently led to fractures because of the uneven quality of the iron. There was no knowledge as yet of any means to prevent rusting, which was accelerated by contact with seawater. It was quickly discovered that encrustation

³ M.F. Sweetser, *King's Handbook of Boston Harbor* (Cambridge: Kings Publishing Company, 1882)

⁴ Cedric R. Nevitt, "American Merchant Steamships," *The Society of Naval Engineers and Marine Architects Transactions 1893-1943* (1945): p.65.

⁵ *Ibid.*, p.65.

of the bottom by barnacles and weed occurred considerably faster on an iron hull than a wooden one. There was also the effect of the iron hull on the magnetic compass. A great mass of hull iron was certain to throw a compass out, and yet there was insufficient scientific knowledge at the time of the behaviour of compasses to provide an antidote.⁶

Two landmark historical commercial ships designed by the famous Isambard Kingdom Brunel in England built wholly of iron were the *Great Britain* (1843) and the *Great Eastern* (1858). The *Great Britain* was the first iron vessel with a propellor of any great size to cross the Atlantic. Several features of her construction became the pattern for future shipbuilding in iron, including the division of her hull by watertight bulkheads and the absence of an external keel.

The *Great Eastern* was a much larger vessel than the *Great Britain* and incurred many financial and practical problems during the building process. Even during the Atlantic crossing the ship was a commercial failure and eventually taken out of commission. Despite these problems, her construction introduced the principle of the cellular double bottom, and she was the first ship to fit a steering engine, at the time a novel means of overcoming the pressure of water on the rudder, now a universal feature in ships of all sizes. Most importantly, she was the first large ship whose underwater shape was designed according to the principles of hydrodynamics.⁷ The *Lawrence's* design incorporates all these milestone features of iron shipbuilding and is an example of a success story in commercial iron shipbuilding in the United States. By the 1880's steel took over from iron as a shipbuilding material.

The *Lawrence* had a single expansion steam engine, a surface condenser and a screw propellor. The top speed of the vessel was 12 knots.⁸ Built in 1969, the *Lawrence* is an example of a nineteenth century vessel representing a transitional stage in steamboat technology. Steam was used in these vessels

⁶Peter Kemp, *The History of Ships* (London: Orbis Publishing, 1978) pp. 152-153.

⁷*Ibid.*, pp. 154, 155, 169.

⁸Nevitt, *Transactions*, p. 65.

almost entirely as an auxiliary means of propulsion, to keep a ship moving when there was no wind to fill the sails.⁹ The shipwreck, *Lawrence*, has the potential to provide unique historical information through archaeological documentation of the mechanical abilities of these often experimental engines, particularly the use of the screw propeller.

Since the inception of screw propulsion in the 1840's, a constant effort has been made to improve the performance of marine propellers. These problems have been addressed by naval architects by: mathematical calculations of pitch of blades, number of blades, and thickness of the blades towards the propeller hub. Dual propulsion by sail and steam, as characterized by the *Lawrence*, was somewhat inflexible. Favorable or adverse winds affected the revolution of the screw, sometimes causing overspeeding of the engine, especially in the case of a sudden squall. Therefore, it was considered desirable by some designers and ship operators to vary the pitch to suit these conditions and to feather the propeller blades. Thus the controllable pitch propeller was developed.¹⁰

These controllable-pitch developments languished in the latter decades of the nineteenth century at the time the *Lawrence* was built and used, until the development of the steam turbine was applied successfully to the navigation of ships in 1892. This turbine, an irreversible mechanism gave new impetus to controllable pitch developments. By rotating the propeller blades to reverse pitch, the full available power of the ahead turbine could be applied for stopping and reversing.¹¹ The mechanical problems that the *Lawrence* was experiencing shortly before the wrecking are very likely to be associated with propeller malfunctioning as a result of these early design disadvantages enhanced by the stormy, squally sea conditions at the time.¹² Other common problems encountered with propulsion systems throughout the nineteenth century included

⁹ Kemp, *History*, p. 147.

¹⁰ J.G. Hill, "The Design of Propellers," *The Society of Naval Engineers and Marine Architects Transactions* 57 (1946): pp. 143-192.

¹¹ Lewis A. Rupp, "Controllable-Pitch Propellers," *The Society of Naval Architects and Marine Engineers* 56 (1948): pp.272-358.

¹² *Savannah Morning News*, 15 February 1899.

drag and cavitation of the propellor, hull vibration, vibration in the machine room, steam piping, and condenser turbines - having an effect of the life of the machinery, and increased wear on the inflexible couplings. Longitudinal vibrations caused by propeller drives have always existed, but only recently received attention in twentieth century vessels of high power such as the *USS North Carolina*, *USS South Dakota*, and *USS Midway*.¹³

To date, the only published archaeological project that has been conducted on a commercial steam vessel with a propellor is that of the *Indiana*, built in 1948, and lost in Lake Superior in Michigan. This wreck was recorded by the Smithsonian Institute in 1970's and declared eligible for the National Register of Historic Places.¹⁴ The *Lawrence* is a later model designed for offshore coastal voyages, instead of inland waters, and could provide a useful environmentally functional and typological comparative study.

The *Betrand*, a paddlewheel vessel, is probably the best example of archaeological documentation of either the eastern or western type of inland steamer. Built in 1865, three years earlier than the *Lawrence*, the steamboat carried a cargo very similar in composition to that of the *Lawrence*. Archaeologists documented the hull structure which yielded specialized data about the construction of steamboats used on the upper Missouri River. It also provided new insights into the stowage methods for cargo and the types of goods utilized by the mid-nineteenth century economy.¹⁵ Archaeologists have traditionally devoted more attention to iron-hulled steamships of the Civil War

¹³ J.R. Kane and R.J. McGoldrick, "Longitudinal Vibrations of Marine Propulsion - Shafting Systems," *The Society of Naval Engineers and Marine Architects Transactions* 56 (1948): pp.193-252.

¹⁴ P.F. Johnston and D.S. Robinson, "The Wreck of the 1848 Propeller *Indiana*: Interim Report," *The International Journal of Nautical Archaeology* 22 (August 1993): pp.219-236.

¹⁵ J.E. Petsche, *The Steamboat Bertrand: History, Excavation and Architecture* (Washington DC: National Park Service Publications, 1974).

such as the *Iron Age*, *John F. Winslow* and the *Monitor*.¹⁶ The construction plans, engine trials and other pertinent historic data about these vessels are more frequently available through naval records than those of commercial ships. The North Carolina State Underwater Archaeology Unit in Kure Beach has in fact nominated a Cape Fear Civil War Period Shipwrecks District which contains 20 wrecks including 4 Union vessels, 15 steamers and one sailing blockade runner.¹⁷

The attention devoted to steamboats by archaeologists, historians and preservationists in other parts of the United States highlights the importance of nominating the *SS William Lawrence* to the National Historic Register. It is apparent that this particular ship fills an important technological gap in the national archaeological and historical record. The ship's hull and machinery embody characteristics of a type, period and method of construction meeting National Register criterion (A) and is likely to yield information important to history - criterion (B).¹⁸

STATE SIGNIFICANCE: COMMERCE

The Merchants and Miners Transportation Company was involved primarily in shipping water hides from leather tanneries in Baltimore, mine products and various raw materials from the manufacturing plants of New

¹⁶ Gordon Watts, *The Civil War at Sea: Dawn of an Age of Iron and Engineering*, ed. George Bass, *Ships and Shipwrecks of the Americas: A History based on Underwater Archaeology* (London: Thames and Hudson Ltd, 1988) pp. 207-225.

¹⁷ Mark Wilde-Ramsing, "National Register Districts as a Management Tool for Underwater Resources," ed. Paul F. Johnston, *Proceedings of the Sixteenth Conference on Underwater Archaeology* No. 4 (1985): pp. 130-133 and Gordon Watts, "Towards Establishing Research and Significant Criteria for Civil War Shipwreck Resources," *Ibid.*, pp. 133-137.

¹⁸ James Delgado, "Nominating Historic Vessels and Shipwrecks to the National Register of Historic Places," *National Register Bulletin* 20 (1985).

England; and to bring back from Boston the finished products. These products, particularly shoes and clothing, were absorbed by the southern markets in large quantities.¹⁹

Preliminary archaeological investigations on the *SS William Lawrence* in 1990 by the South Carolina Institute of Archaeology and Anthropology indicate that vessel was carrying a cargo of merchandize containing a high volume of leather shoes, rolls of fabric and a variety of clothing items. The cargo also included quantities of glassware and containers still filled with medicines, pickles, and preserves. Goods such as toys, identical dolls, ornaments sets, artwork and comic books form an important component of the cargo.²⁰ These items reflect the formative years of commercial consumption in the South and bulk manufacture of luxury goods in North which started taking place in the latter part of the nineteenth century.

The cargo of the *Lawrence* can be compared to that of another commercial steamboat river wreck investigated by SCIAA, the *SS Robert Martin* lost on the Pee Dee River at Cheraw, dating to the mid-1800's. The *Robert* carried essential supplies such as hardware, building supplies and crockery.²¹ The *Lawrence* carried non-essentials, representing economic trends on the eastern seaboard in the late nineteenth and early twentieth century. First, an increase in the economic per capita of the population, secondly decreased working hours and a related increase in leisure time to enjoy these items. The presence of bottled pickles and preserves on the shipwreck site is also typical of the late nineteenth century when there was a growing demand for out of season vegetables, as well as

¹⁹ William B. Taylor, "A Brief History of the Merchants and Miners Transportation Company," *Journal of the Steamship Historical Society of America* 38 (June 1951): pp. 1-3.

²⁰ State Site Inventory File for *SS William Lawrence* (38BU709), South Carolina Institute of Archaeology and Anthropology, University of South Carolina and Slide Catalog of the Underwater Archaeology Division.

²¹ Lynn Harris, "The *SS Robert Martin*: A Preliminary Historical and Archaeological Investigation," *Proceedings of the Conference on Underwater Archaeology* (1990): pp.153-155.

concerns about the adverse effects of fresh fruit and vegetables on health.²²

Each bottle of pickles recovered by divers from the Lawrence the contains vegetable items which are carefully arranged, colorful and visually appealing. In every receipt the pattern is duplicated - the cauliflower heads in the center, dills alongside and carrots at the top. This apparent concern with the aesthetics of these products substantiates the presence of a consumer marketing strategy designed to make the preserves look attractive to the potential buyers. Newspapers of this time contain numerous advertisement listing pickles and preserves indicating that it was a competitive market in the South.²³

Many of the medicine bottles, like the pickle bottles, still contained substances. The contents of a bottles labelled *Dr. De Witts Liver Blood and Kidney Cure* was analyzed by SCIAA Conservation Laboratory. The mixture was very high in alcoholic content. DeWitts International Corporation is now *Church and Dwight* of Greenville, South Carolina. They no longer make analgesics, but instead dental care products for *Arm and Hammer*.²⁴

Classware associated historically with a very singular period in South Carolina's history, the South Carolina Dispensary System, was found aboard the wreck. From 1893 to 1907, South Carolina bottled and sold all liquor in the state as part of the pre-prohibition era attempts to limit alcoholic consumption. This system was the brainchild of Governor Ben Tillman, one of South Carolina's most illustrious and controversial governors. Dispensary bottles were manufactured in states such as Baltimore, New York and Pennsylvania. Cargoes of bottles were brought ships to be filled at Dispensary warehouses around South Carolina. The empty bottles aboard the Lawrence were evidently being shipped to the port of Savannah, where they would be transported inland up the Savannah River to the

Volume 27, No. 2 (1993):pp.42-56.

²³ Olive M. Jones, "Commercial Foods," *ibid.*, pp.25-41.

²⁴ Interview with Mr. Volz, Church and Dwight of Greenville, SC., 20 April 1991.

dispensary warehouse in North Augusta.²⁵

The well-preserved cargo of the *Lawrence* shipwreck represents a time capsule of a variety consumer goods utilized by South, especially South Carolina and Georgia, in the latter part of the nineteenth century. It also fits criterion (A) of the National register by virtue of association with commercial events that have made a significant contribution to the broad pattern of history.

LOCAL SIGNIFICANCE: THE WRECKING

The Savannah Morning News includes a series of news updates from the date of the *Lawrence* wrecking in a ice storm in early February 1899 through to the end of the month when the majority of the crew had been rescued. The wrecking incident occurred in the vicinity of Port Royal. A Port Royal pilot boat assisted the *Lawrence's* crew who experienced severe suffering as they attempted to make their way in frail life boats to Port Royal Harbor. The newspaper articles describe the horrors of their many hours of offshore buffeting by icy blasts. The situation was so desperate that the party discussed suicide as an option to end their extreme physical distress. When rescued by the Pilot Boat they were in critical condition with frost bitten hands and legs.²⁶

The one boatload of survivors describe the personalities of individuals during this life threatening situation - an Irishman, John Montgomery who told stories and jokes to keep his companions awake and alive. When despair settled over some and they spoke about death he would claim he saw a light in the distance and approaching rescue boats. In fact, he was the first to spot another boat and signal it to come to their rescue. Heroic individuals on the other lifeboats are also described in detail - including activities and songs they initiated to keep spirits up and cold limbs moving.²⁷

²⁵ Philip Huggins, *The South Carolina Dispensary: A Bottle Collectors Atlas and History of the System* (Columbia: Sandlapper Press, 1971).

²⁶ Savannah Morning News, 15 February 1899.

²⁷ *Ibid.*

When the survivors reached Port Royal Harbor they were warmly welcomed. Captain Willis of the *Lawrence* spoke highly of Sergeant Smith and Edwin P. Shattuck, the government surgeon at Hilton Head, who spent time attending to the needs of the wreck survivors. Many were permanently maimed by frost bite injuries incurred in over 50 hours in the snow storm without food or shelter. Only one member of the *Lawrence's* crew did not survive - Edward Roach, the chief engineer.²⁸

The location of the shipwreck and subsequent events link the commendable rescue operation to the community of Hilton Head, especially Pilot boat operators and the government surgeons office. From this perspective the *Lawrence* is of local historical significance to Hilton Head area. It is currently an extremely popular fishing and scuba diving site particularly for the Beaufort and Hilton Head community.²⁹

²⁸Savannah Morning News, 16 and 22 February 1899.

²⁹Interview with Anne Lewis, Hilton Head Dive and Travel, Hilton Head, SC., 6 June 1992.

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